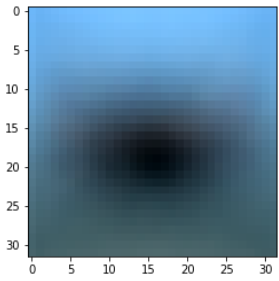
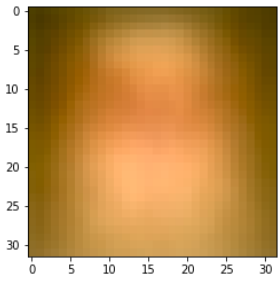
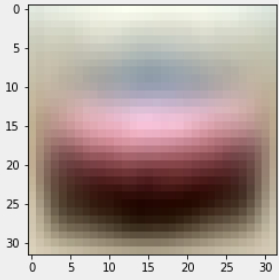
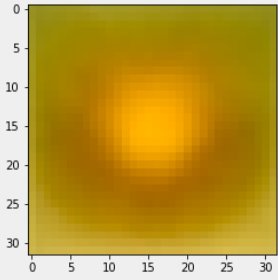
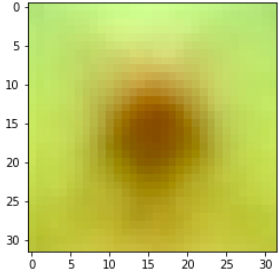
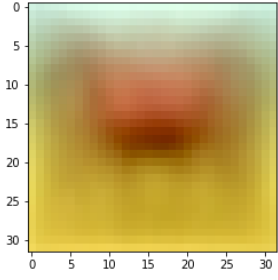
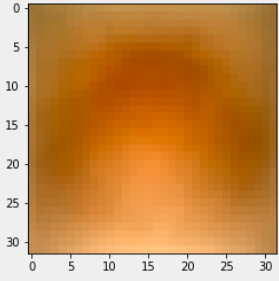
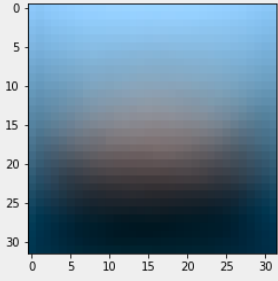
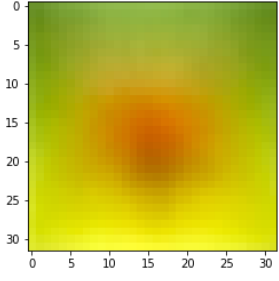
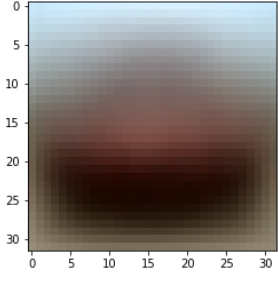
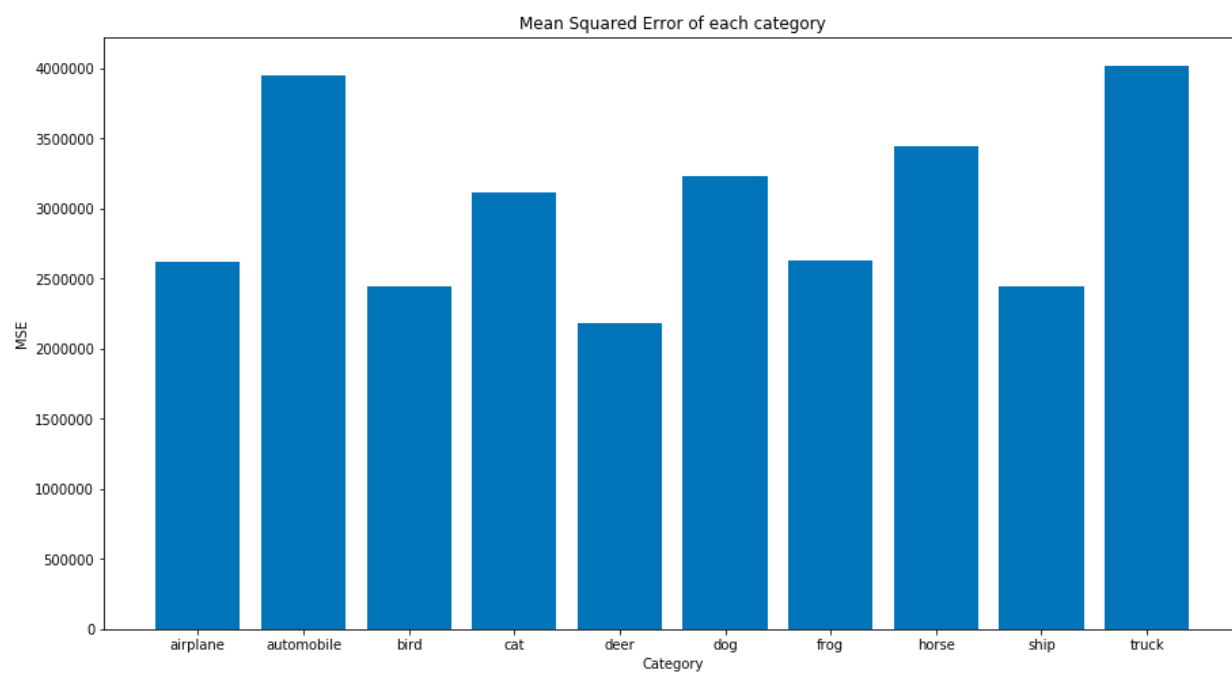


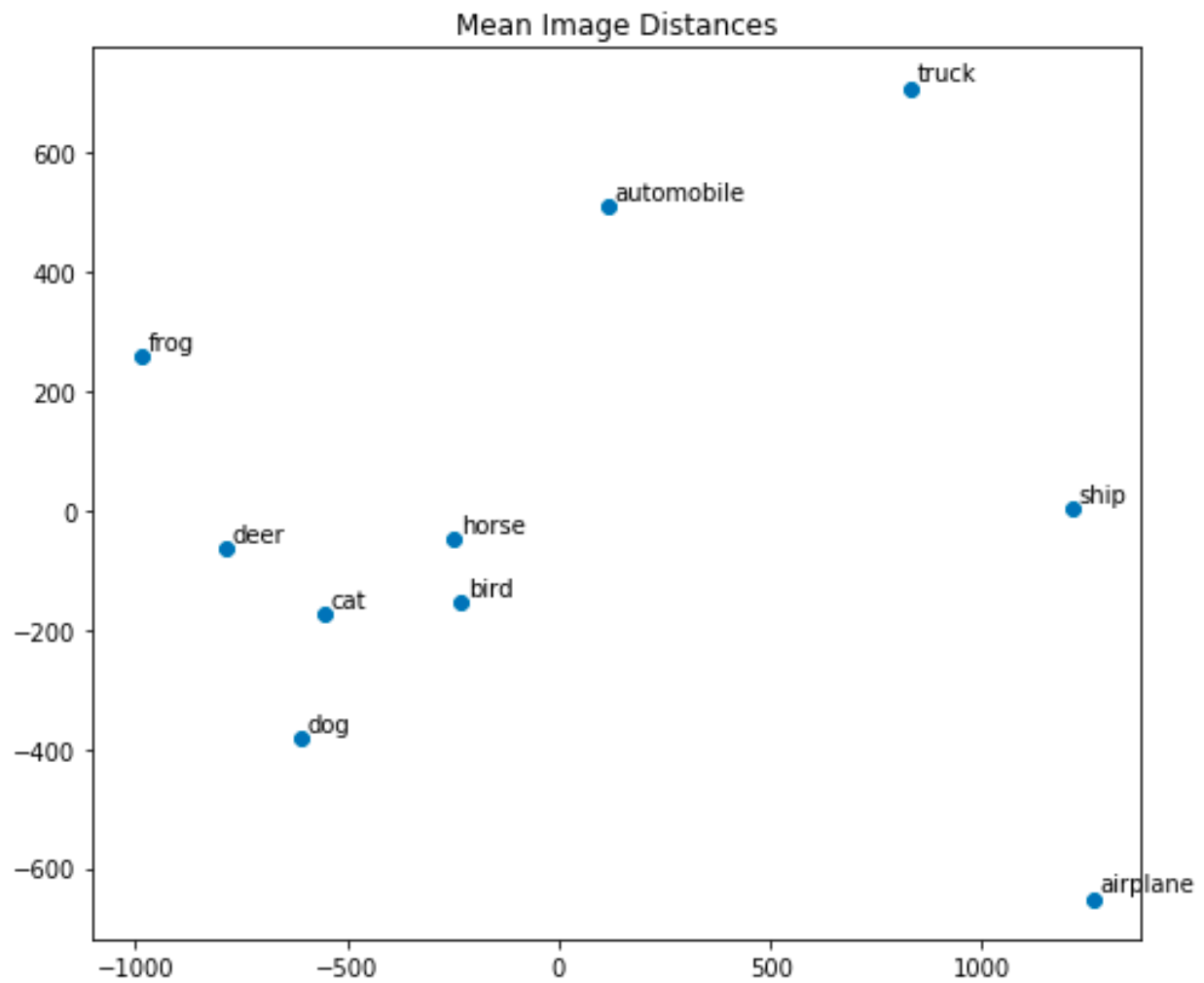
Homework 4 Report

Class	Image	Class	Image
airplane	 A heatmap visualization for the 'airplane' class. The image is a 32x32 grid with axes labeled 0 to 30. The color distribution is predominantly blue and dark blue, with a darker, more concentrated area in the center.	dog	 A heatmap visualization for the 'dog' class. The image is a 32x32 grid with axes labeled 0 to 30. The color distribution is predominantly orange and yellow, with a darker, more concentrated area in the center.
automobile	 A heatmap visualization for the 'automobile' class. The image is a 32x32 grid with axes labeled 0 to 30. The color distribution is predominantly pink and purple, with a darker, more concentrated area in the center.	frog	 A heatmap visualization for the 'frog' class. The image is a 32x32 grid with axes labeled 0 to 30. The color distribution is predominantly yellow and orange, with a darker, more concentrated area in the center.
bird	 A heatmap visualization for the 'bird' class. The image is a 32x32 grid with axes labeled 0 to 30. The color distribution is predominantly green and yellow, with a darker, more concentrated area in the center.	horse	 A heatmap visualization for the 'horse' class. The image is a 32x32 grid with axes labeled 0 to 30. The color distribution is predominantly yellow and orange, with a darker, more concentrated area in the center.
cat	 A heatmap visualization for the 'cat' class. The image is a 32x32 grid with axes labeled 0 to 30. The color distribution is predominantly orange and yellow, with a darker, more concentrated area in the center.	ship	 A heatmap visualization for the 'ship' class. The image is a 32x32 grid with axes labeled 0 to 30. The color distribution is predominantly blue and dark blue, with a darker, more concentrated area in the center.
deer	 A heatmap visualization for the 'deer' class. The image is a 32x32 grid with axes labeled 0 to 30. The color distribution is predominantly green and yellow, with a darker, more concentrated area in the center.	truck	 A heatmap visualization for the 'truck' class. The image is a 32x32 grid with axes labeled 0 to 30. The color distribution is predominantly dark blue and black, with a darker, more concentrated area in the center.

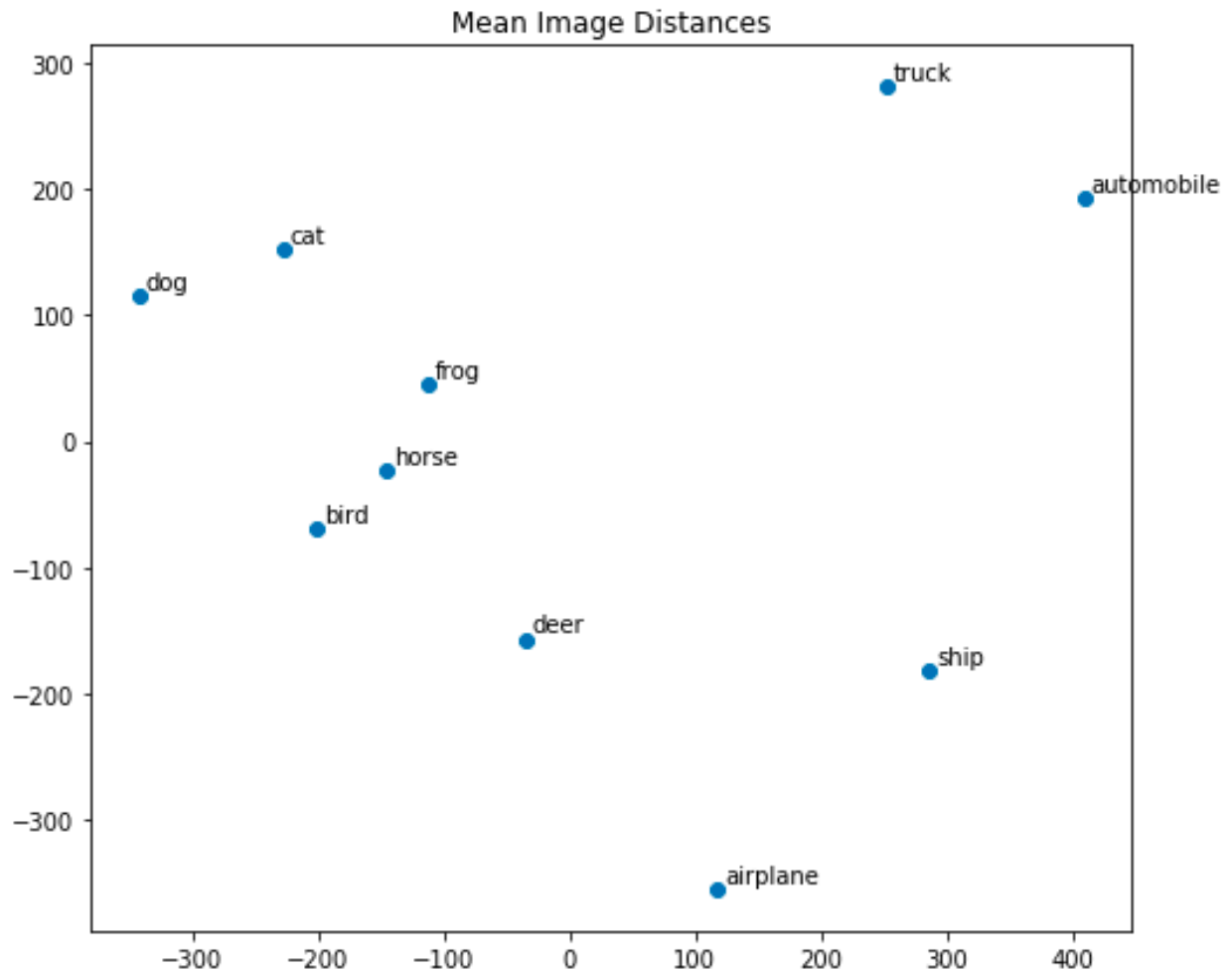
Page 2 A plot of sum-squared error from representing a class with the first 20 principal components of that class, for each class



Page 3 2D scatter plot obtained after performing principal coordinate using euclidean distance.



Page 4 2D scatter plot obtained after performing principal coordinate using similarity metric in part C.



The two scatter plots look differently, since the similarity methods are different. Euclidean distance is applied in the first part, by $distance = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$. In the second part, the similarity is measured as $similarity = \frac{E(A \rightarrow B) + E(B \rightarrow A)}{2}$, $E(A \rightarrow B)$ is the average error obtained by representing all images of class A using the mean of class A and the first 20 principal components of class B.

Citation:

<https://stackoverflow.com/questions/35995999/why-cifar-10-images-are-not-displayed-properly-using-matplotlib>

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